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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Donald K. Smith

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TESTA, HURWITZ & THIBEAULT, LLP  
HIGH STREET TOWER  
125 HIGH STREET  
BOSTON, MA 02110

EXAMINER

FERNANDEZ, KALIMAH

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 07/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

10/017,766

Applicant(s)

SMITH ET AL.

Examiner

Kalimah Fernandez

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 43 is objected to because of the following informalities:  
typographical error (i.e. the phrase "the at"). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7, 11, 13-15, 19-20, 25 and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat 5,610,397 issued to Kelley.
3. Kelley discloses an ion trap that defines a volume (16) for storing a plurality of ions (col.2, lines 56-59).
4. Kelley discloses a radio frequency (rf) generator (14)) that is electromagnetically coupled to the volume (16) defined by the ion trap, the

rf generator (14) generating an RF electrical field that stores the plurality of ions in the ion trap (col.2, lines 59-64).

5. Kelley discloses switching off (or termination) of the RF electrical field (col.5, lines 1-4) wherein the termination of said RF electrical field ejects a plurality of ions from the ion trap (col.4, lines 40-45). In addition, Kelley discloses the control (e.g. the switching off and on) of the rf generator (14) via controller (31).

6. Kelley discloses an ion detector (24) that is substantially synchronized to controller (31) (col.3, lines 15-21, lines 45-51).

7. As per claims 2-4, Kelley discloses an ion source (17) that generates the plurality of ions to the ion trap (col.3, lines 7-14, lines 58-61). In addition, Kelley discloses generation of the ions within the volume (16) as described in col.3, lines 12) or externally production of ions as described in col.3, lines 59-61).

8. As per claims 5-6, Kelley discloses the ion source comprising of an electron source having a thermionic emission filament (17) (col.3, lines 7-9).

9. As per claim 7, Kelley discloses the detection of ions during (i.e. synchronized to the generation of ions by the ion sources (col.3, line 67- col.4, line 5).

10. As per claims 11 and 13-14, Kelley discloses ion trap comprises a substantially cylindrically shaped volume with hyperbolic shaped walls (see fig.1).

11. As per claim 15, Kelley discloses the switching device (i.e. controller (31)) is electronic switching device (col.3, lines 46-51; fig. 1).

12. As per claims 19-20, Kelley discloses the switching device (31) and ion detector are substantially synchronized with a predetermined phase of the RF electrical field (col.5, lines 1-4; fig.2).

13. As per claim 25, Kelley discloses electron multiplier (24) (col.3, lines 15-18).

14. As per claim 39, Kelley discloses a method for detecting by establishing a RF electrical for trapping ions in a volume (16) (col.2, lines 56-64; terminating the RF electrical field thereby ejecting ions from the volume (16) (col.5, lines 1-4); detecting at least a portion of ejected ions at a predetermined time (i.e. after period A) after terminating the RF electrical field (see fig.2).

15. Claims 1-3,8-14,16-17, 22-31,33,35, 37-40, and 43-46 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat No 5,650,617 issued to Mordehai.

16. Mordehai discloses an ion trap that defines a volume for storing ions (see fig. 1).

17. Mordeshai teaches a RF generator, which generates a RF electrical field that stores ions within the ion trap (col. 6, lines 5-8).

18. Mordeshi discloses a switching device for terminating the RF electrical field for ejecting ions from the ion trap and ion detection that is synchronized with the switching off of the RF electrical field (col.7, lines 2-5).

19. As per claims 2-3, Mordeshi discloses an ion source (10) provides ions to said ion trap (20) (col.6, lines 47-48).

20. As per claims 8-10,28, 37 and 40, Mordeshi discloses the injection of neutral gas via a pulsed mechanism (col.6, lines 55-57).

21. As per claims 11-14 and 29-31, Mordeshi discloses a cubic ion trap having straight walls and a cylindrically shaped volume having hyperbolic shaped walls (see figs.2 and 8; col.7, lines 6-9).

22. As per claims 16-17,33, and 45, Mordeshi discloses a mechanical switching device (85), which causes a short-circuit condition that terminates the electrical field (col.4, lines 37-42).

23. As per claims 22-24,26,38-39,43-44, and 46, Mordeshi discloses timing the accumulation period (col.5, lines 45-52; col.6, lines 53-55). In addition, Mordeshi discloses the synchronization of the operation of mass analyzer with the termination of the RF electrical field (col.7, lines 1-5).

24. As per claims 25 and 35, Mordeshi discloses the use of an electron multiplier detector (col.6, lines 30-31).

### ***Claim Rejections - 35 USC § 103***

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. Claims 8-10,18,20,22-24,26-29,31-32,34-35,37-38,40-44 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat No 5,610,397 issued to Kelley and US Pat No 6,140,641 issued to Yoshinari et al.

27. Kelley discloses the claimed invention but does not explicitly teach the following recited limitations: neutral gas interaction; clock; and predetermined time.

28. However, Yoshinari et al teaches the use of neutral gas interaction to facilitate the generation of ion within the ion trap (col.4, lines 46-50;col.6, lines 11-18).

29. In addition, Yoshinari et al teaches timing the mass analysis periods having a predetermined time using a synchronizing device (3) (col. 7, lines 17-22; col.7, lines 41-49).

30. Furthermore, Yoshinari et al teaches predetermined phase of the RF electrical field (col.7, lines 49-57).

31. It would have been obvious to an ordinary artisan to incorporate the teachings of Yoshinari et al into Kelley since Yoshinari teaches improving resolution and increasing the scanning rate (col.1, lines 55-59).

32. Claims 21 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mordehai '617.

33. Mordehai teaches the claimed invention except for synchronization of ion detection with interruption of the vacuum pump.



34. However, Mordehai discloses the generation of pressurized environment (col.5, lines 48-50) by pulsing buffer gas into said ion trap. It would have been obvious to an ordinary artisan at the time this invention was made to interrupt the operation of the vacuum pump with the detection of said ions since obviously the evacuation forces of vacuum pump will affect the collection of said ions for detection.

### ***Conclusion***

35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat No 5,714,755 issued to Wells et al teaches the conventional knowledge in the art (see col.6, lines 40-42, lines 65-67). US Pat No. 00RE36906 issued to Franzen et al teaches mechanical switching means. Finally, US Pat No. 5,859,433 issued to Franzen teaches the vacuum environment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalimah Fernandez whose telephone number is 703-305-6310. The examiner can normally be reached on Mon-Thus between 8:30am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on 703-308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

kf  
July 10, 2003

JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800